OPTICAL CHARACTERISTICS OF A TURBID MEDIUM BETWEEN MIRRORS*

Rebecca Wenning, Q. Su, R. Grobe

Abstract

Using the one-dimensional Boltzmann equation we examine the optical scattering properties of a turbid medium that is located between two mirrors [1] with controllable reflectivity. We focus on the question how these mirrors can be used to enhance the total transmission of an intensity modulated laser beam through this system [2]. The analytical results show that for certain modulation frequencies the total transmission can be increased if the laser source is placed between the mirrors. This finding could improve diffusive imaging for those highly scattering media that are so extended that the laser light would not penetrate sufficiently deep in the absense of any mirrors.

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[1] R. Wenning, Q. Su and R. Grobe, Phys. Rev. E (submitted).

[2] J.C. Henderson, Q. Su and R. Grobe, Las. Phys. 14, 515-520 (2004).

Category

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